Remarks

Applicants hereby confirm the election of method claims 1-7, and cancel claims 8-21. Claims 1-7 were rejected under 35 USC 102 and/or 103 based on US Patent 5,847,796 to Uchiyama et al. Applicants have also canceled claims 1-7 above and replaced them with new method claims 22-41. Applicants respectfully traverse the rejection as applied to new claims 22-41.

New claim 22 recites a method of forming a bonded assembly. An IC chip is positioned adjacent to a substrate with a thermosetting adhesive between the IC chip and the substrate to adhere the IC chip to the substrate. The substrate comprises an epoxy resin reinforced with fiberglass. The substrate is irradiated with near infrared light toward the IC chip such that some energy of the light is absorbed by the substrate and some energy of the light passes through the substrate to the adhesive to partially cure the adhesive.

Thus, new claim 22 recites that the substrate comprises **an epoxy resin reinforced with fiberglass**. In contrast, the substrate of Uchiyama et al. is **soda glass**. See Column 10 lines 29-30. Therefore, there should be no 35 USC 102 rejection. It would not have been obvious in view of Uchiyama et al. to irradiate a thermosetting adhesive with near infrared light through a substrate comprising an epoxy resin reinforced with fiberglass because it was not obvious that enough of the energy of the light would pass through the epoxy resin reinforced with fiberglass to the adhesive, to substantially cure the adhesive.

New, dependent claim 23 further distinguishes over Uchiyama et al. by reciting that the substrate comprises FR4 material. As explained above, Uchiyama et al. teach a substrate made of soda glass. It was not obvious in view of Uchiyama et al. that a substrate made of FR4 material would pass enough of the energy of the infrared light to substantially cure the adhesive.

New, dependent claim 25 recites the step of halting the irradiating step after the adhesive is heated to a predetermined, curing temperature, and after the halting step, cooling the assembly

to substantially room temperature and **applying pressure on the IC chip toward the substrate during substantially the entirety of the cooling step**. This is described in the specification of the present invention,

> "When thermosetting ACF 24 is heated up to a specified temperature, irradiation of near infrared rays 36 is terminated. In the next step, silicon chip 21 and array substrate 23 are pressed together by pressure indirectly applied to silicon chip 21 by pressurizing block 11 (S 105). As understood, substrate 23 is firmly supported by block 15. Thereafter, silicon chip 21, thermosetting ACF 24 and array substrate 23 are cooled to room temperature (S 106). Here, silicon chip 21 and the glass component that constitute array substrate 23 have approximately the same degrees of contraction. Thus, in this cooling process, an unacceptable temperature difference (gradient) between the silicon chip and array substrate is prevented in order to achieve such uniform contraction." Page 14 line 24 to page 15 line 6.

In contrast, **Uchiyama et al. teach the removal of the pressure during cooling**:

> "The bonding conditions include a temperature 220 degrees C, a pressure of 5 gf/mm squared, and a time of 20 seconds. The quality of the light applied and the pressure are set so as to establish these conditions. Then, heating by the light 13 is stopped to decrease the temperature to 150 degrees C under pressure by the bonding tool 4 and pressing by the bonding tool 4 is then stopped.." Column 14 lines 20-27

Thus, Uchiyama et al. teach away from the present Therefore, dependent claim 25 would not have been obvious in view of Uchiyama et al.

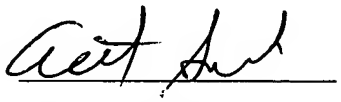
New dependent claim 27 recites that a **quartz infrared halogen lamp** is used to perform the step of irradiating said substrate. In contrast, Uchiyama et al. uses a **xenon lamp**. See Column 13 lines 26-36. While Uchiyama et al. states a "xenon lamp or the like", this is not sufficiently specific to anticipate a quartz infrared halogen lamp. Therefore, there should be no 35 USC 102 rejection.

New claims 29-35 distinguish over Uchiyama et al. for similar reasons as new claims 22-28.

New claims 36-41 distinguish over Uchiyama et al. for similar reasons as new claims 22-28.

Based on the foregoing, Applicants request allowance of the present patent application as amended above.

Respectfully submitted,



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